Operating Manual

iSOLATE100 & iSOLATE100M

iSOLATE100 II(2) GD Ex [ia] IIC T4
iSOLATE100m II(2) GD Ex m [ia] IIC T4
IP 67 T135℃

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Document Number **313960** (See Last Page for Revision Details)

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1 Introduction

The iSOLATE100 is an ATEX certified intrinsically safe PS2 and serial interface suitable for industrial use. The device allows connection of hazardous area peripherals such as pointing devices, keyboards and scanners to PC systems located in a safe area. The iSOLATE100 is designed for use with Extronics own range of keyboards and pointing devices such as trackball, trackpad or finger mouse but can be used with other manufacturers compatible equipment.

The iSOLATE100 is certified allowing connection of peripheral devices in Zone 1 & 2 hazardous locations.

The unit is simple to operate and is available in a variety of configurations as specified in the ordering data below.

With both galvanic and optical isolation for the power and the interfaces no high integrity earth is required or consideration about potential differences occurring meaning low simple and trouble free installation.

Keyboard or pointing device may be up to 20 metres away from the PC in the hazardous area using a PS2 cable or up to 70 metres using a CAT6 STP cable

2 Safety Information and Notes

2.1 Storage of this Manual

Keep this user manual safe and in the vicinity of the device. All persons who have to work on or with the device should be advised on where the manual is stored.

2.2 List of Notes

The notes supplied in this chapter provide information on the following.

- Danger / Warning.
  - Possible hazard to life or health.
- Caution
  - Possible damage to property.
- Important
  - Possible damage to enclosure, device or associated equipment.
- Information
  - Notes on the optimum use of the device

Warning	**Repairs, Dangerous Chemicals** **If the unit is in need of repair, please contact Extronics for an RMA form and returns number.** **A note describing the fault must always accompany equipment sent to Extronics Ltd for repair.** **The following procedures must be carried out before the iSOLATE100 module is returned for repair:** **Remove all residues that may be present. Pay special attention to the gasket grooves and crevices where residue may collect.** **Please ensure that full precautions have been taken to remove all traces of substances that may represent a health risk before returning any equipment.** **Costs of disposal of materials or of injury to personnel (acid burns etc.) arising because of defective cleaning of the equipment will be charged to the owner of the equipment.**

Caution	**Safe operation of the iSOLATE100 is maintained providing that all instructions and warnings contained in this manual are fully observed.**

Important	**Ensure that the cable is used which suits the environment in which the iSOLATE100 is installed.**

3 Installation and Setting-to-Work

3.1 Operation

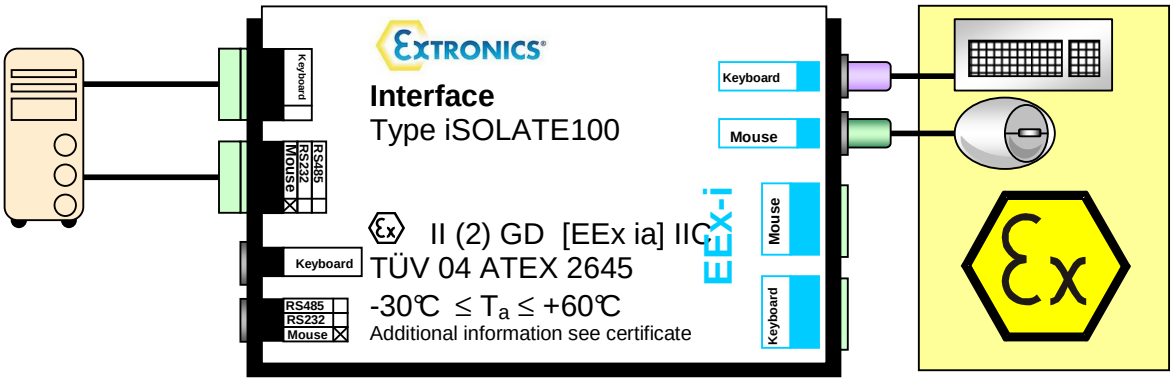
The iSOLATE100 supports both PS/2 mouse and keyboard interfaces, the iSOLATE100 can support other alternative interface options including RS-232 and RS485 provided they are specified when ordered.

3.2 Installation

The unit is simply installed in a safe area, with the PC connected on the safe area connections & the hazardous area devices connected to the hazardous area connection, as shown in the drawings below. The iSOLATE100 can be configured in 4 modes these are detailed below.

NOTE
Modes can only be configured by Extronics.

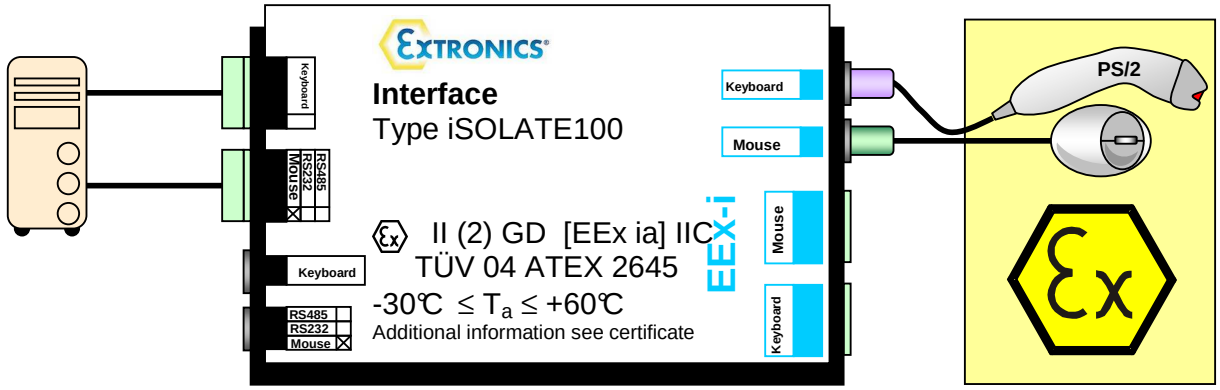
3.3 Version EX01



The EX01 variant provides the capability to connect one EExi keyboard and/or one EExi pointing device. These can be connected to either the screw terminals or the PS/2 ports on the iSOLATE100.

The PS/2 connection sockets or screw terminals connect to the PC in the safe area. All leads and terminals are included.

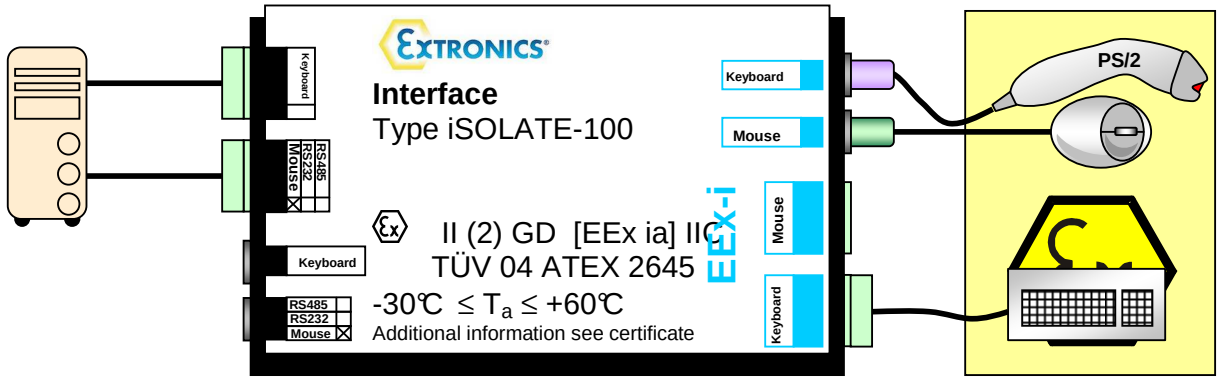
PS/2 scanner connections with version EX01:



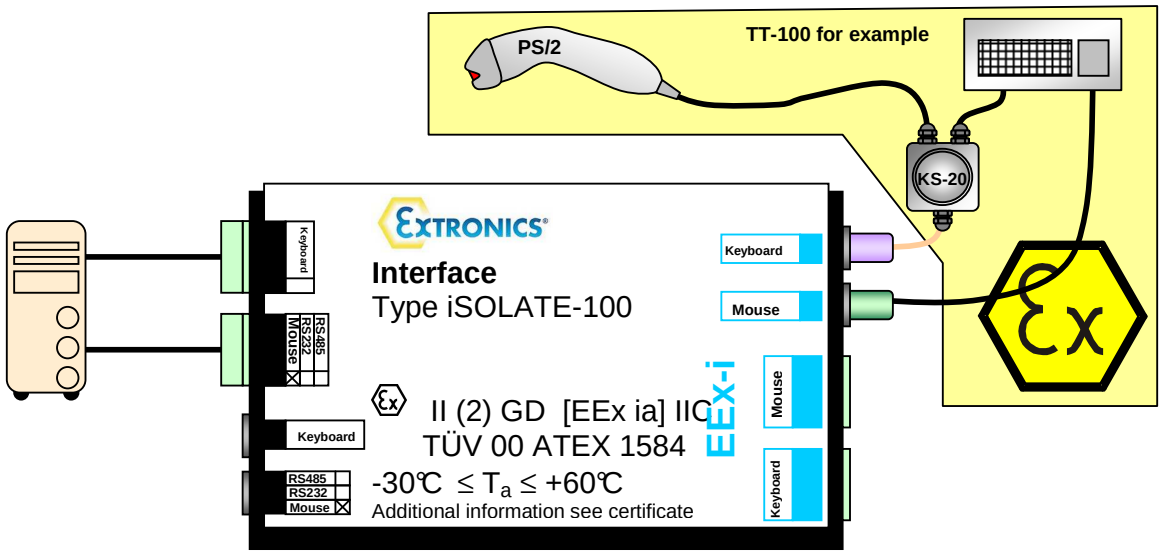
An EExi PS/2 Scanner such as the iSCAN100 can be connected on the hazardous side of the iSOLATE instead of a keyboard. In this configuration the mouse may or may not be connected.

Since a PC does not detect a barcode scanner as a keyboard, the PC may discard the scanner's signals by switching off the keyboard channel after booting. In this case, please cancel the keyboard test in the BIOS settings of your PC or wire a keyboard in parallel to the scanner. Different ways of doing this are shown below;

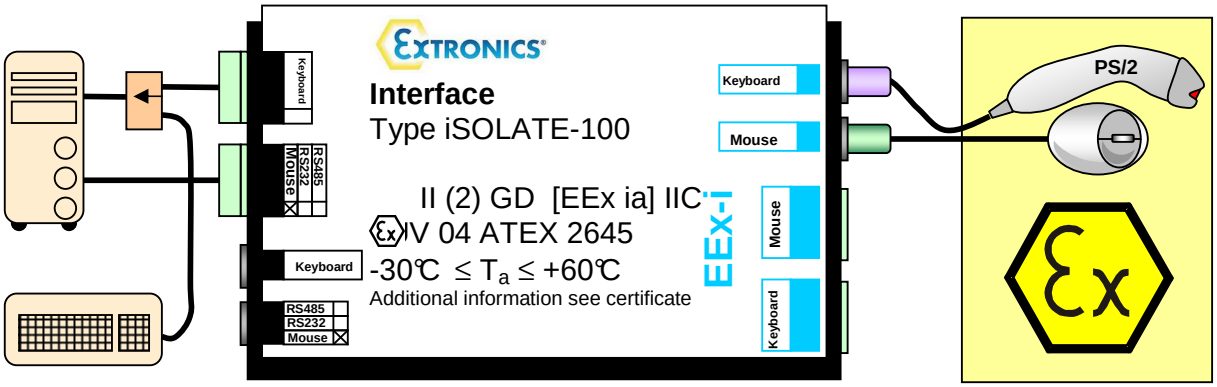
- using the screw terminals wired in parallel with the PS/2 terminal on the hazardous side



- or using the external keyboard wedge KS-20 inside of an EEx d enclosure



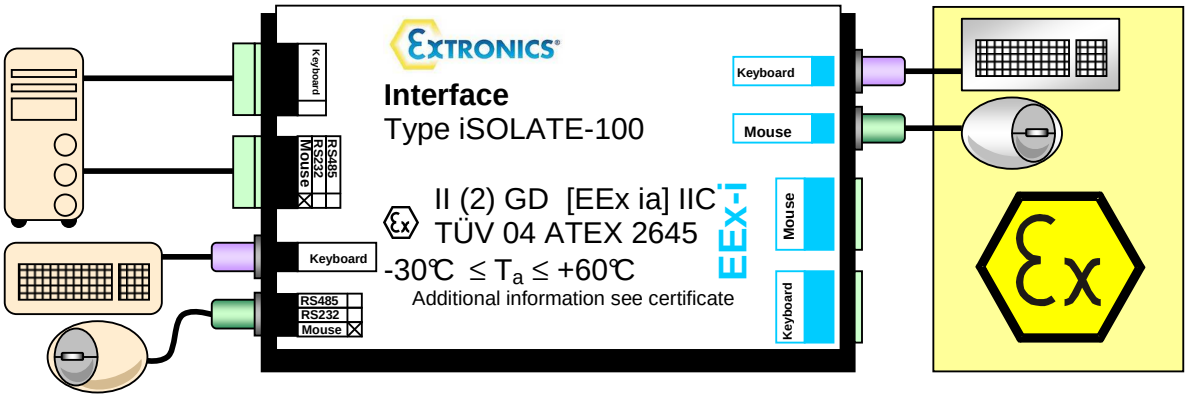
- by using a keyboard wedge in the safe area



Furthermore, you may connect a keyboard to the safe side of iSOLATE100 using its built-in keyboard wedge. Please refer to version Ex02.

Information	**A Keyboard wedges connects 2 devices to a single channel. Using a keyboard wedge is effectively like connecting and disconnecting devices repeatedly. Not every PC will accept this, wiring the scanner and keyboard in parallel is often the more reliable solution.**

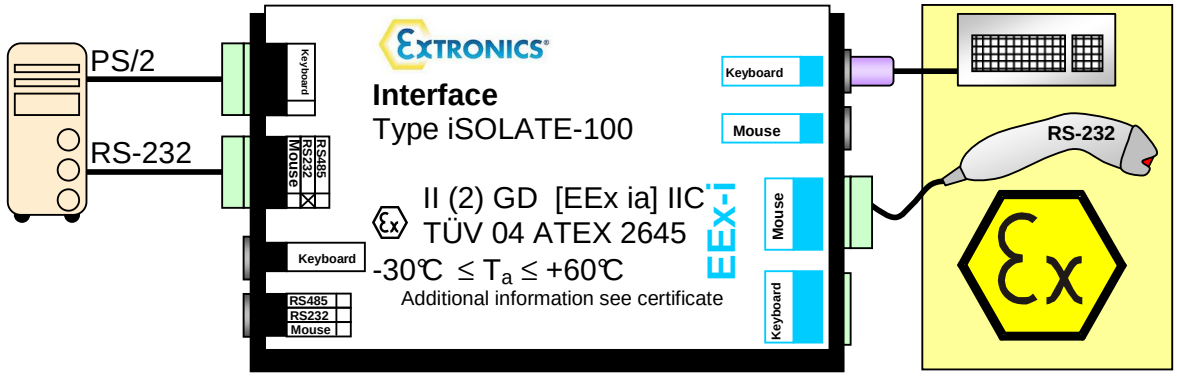
3.4 Version EX02



The EX02 variant provides the capability to connect an EExi keyboard and/or pointing device in the hazardous as well as a safe keyboard and/or pointing device in the safe area. This is due the internal keyboard wedge of the iSOLATE100 which is configured such that it connects both sides of the iSOLATE100 in parallel, including the EExi screw terminals.

You can use a PS/2 scanner instead of a keyboard, however most PCs need a keyboard while booting. To avoid this, please refer to the solutions explained in version Ex01.

3.5 Version EX03

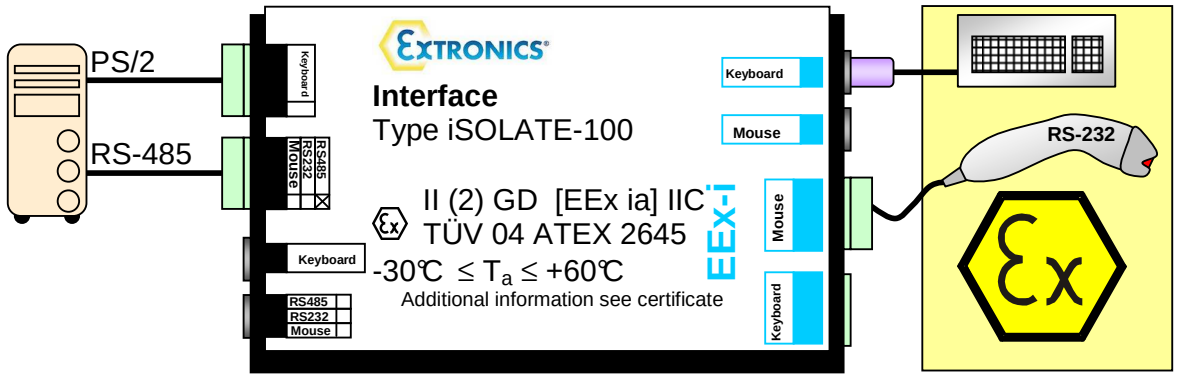


The EX03 variant provides the capability to connect an EExi RS-232 barcode scanner, such as the iSCAN100, in the hazardous area. The scanner must be connected to the iSOLATE100's mouse port even if there is no keyboard connected. This is because of the internal circuit to the RS-232 output terminals. The EExi PS/2 and screw terminals are wired in parallel so either can be used.

The PS/2 sockets for the keyboard and mouse in the safe area are internally wired to the keyboard wedge circuit, however the keyboard wedge is not activated (which makes PC communication easier). Should the keyboard wedge need to be activated please see EX02.

Information	**A Keyboard wedges connects 2 devices to a single channel. Using a keyboard wedge is effectively like connecting and disconnecting devices repeatedly. Not every PC will accept this, wiring the scanner and keyboard in parallel is often the more reliable solution.**

3.6 Version EX04



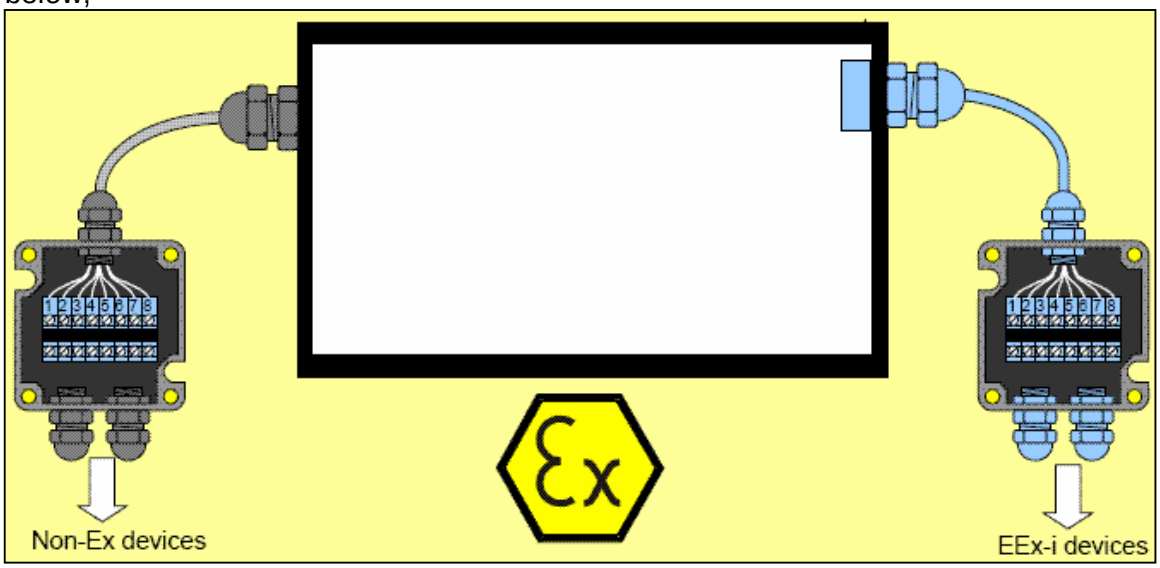
The EX04 variant provides the capability to connect an EExi RS-232 barcode scanner, such as the iSCAN100, in the hazardous area. The iSOLATE100 converts the RS-232 signals to RS-485 and transmits this to the PC. The scanner must be connected to the iSOLATE100's mouse port even if there is no keyboard connected. This is because of the internal circuit to the RS-232 output terminals. The EExi PS/2 and screw terminals are wired in parallel so either can be used.

The PS/2 sockets for the keyboard and mouse in the safe area are internally wired to the keyboard wedge circuit, however the keyboard wedge is not activated (which makes PC communication easier). Should the keyboard wedge need to be activated please see EX02.

Information	**A Keyboard wedges connects 2 devices to a single channel. Using a keyboard wedge is effectively like connecting and disconnecting devices repeatedly. Not every PC will accept this, wiring the scanner and keyboard in parallel is often the more reliable solution.**

3.7 iSOLATE100M

The iSOLATE100M has been certified ATEX II 2 G EEx m [ia] IIC T4, II D T75℃ IP67 for use inside the hazardous area. The unit can be supplied with 2 junction boxes connected to the iSOLATE100M via 1.5m of cable at each end as shown below;



Non-Ex side	
1	+5V
2	M-Data
3	GND
4	M-Clock
5	+5V
6	K-Data
7	GND
8	K-Clock

EExi side	
1	+5V
2	M-Data
3	GND
4	M-Clock
5	+5V
6	K-Data
7	GND
8	K-Clock

or with flying leads. The iSOLATE100M has the same configuration options as the iSOLATE100 (e.g. iSOLATE100EX03) which must be specified when ordering.

3.8 Operation

Once all connections have been made, switch on the PC and check that all of the peripheral devices (keyboard, barcode scanner or pointing device) are functioning correctly.

4 Intended Purpose Usage

Important	**Before setting the units to work, read the technical documentation carefully.**

Important	**The latest version of the technical documentation or the corresponding technical supplements is valid in each case.**

The iSOLATE00 is built using modern components and is extremely reliable in operation; however it must only be used for its intended purpose. Please note that the intended purpose also includes compliance with the instructions issued by the manufacturer for installation, setting up and service.
Any other use is regarded as conflicting with the intended purpose. The manufacturer is not liable for any subsequent damage resulting from such inadmissible use. The user bears the sole risk in such cases.

4.1 Transportation and Storage

All iSOLATE100 devices must be so transported and stored that they are not subjected to any excessive mechanical stresses.

4.2 Authorized Persons

Only persons trained for the purpose are authorized to handle the iSOLATE100; they must be familiar with the unit and must be aware of the regulation and provisions required for explosion protection as well as the relevant accident prevention regulations.

4.3 Cleaning and Maintenance

The iSOLATE100 and all its components require no maintenance. All work on the iSOLATE100 by personnel who are not expressly qualified for such activities will cause the Ex approval and the guarantee to become void.

The iSOLATE100 does not require any active maintenance, do not attempt to open the iSOLATE100 to repair the unit, otherwise the iSOLATE100 may not comply with the ATEX regulations.

It is recommended that the iSOLATE100 is regularly inspected for deterioration caused from wear and tear, accidental damage, and corrosion by chemicals etc. This is to ensure the integrity of the protection is maintained at the intended level of security from ignition in compliance with ATEX regulations.

Should you be in any doubt about the integrity of your keyboard then please return it to Extronics for inspection.

4.4 Safety Precautions

Important	**For the installation, maintenance and cleaning of the units, it is absolutely necessary to observe the applicable regulations and provisions concerned with explosion protection (EN 50014, EN 60079-14:2003) as well as the Accident Prevention Regulations.**

4.5 Cleaning and Maintenance Intervals

The cleaning intervals depend on the environment where the system is installed.

4.6 Aggressive substances and environments

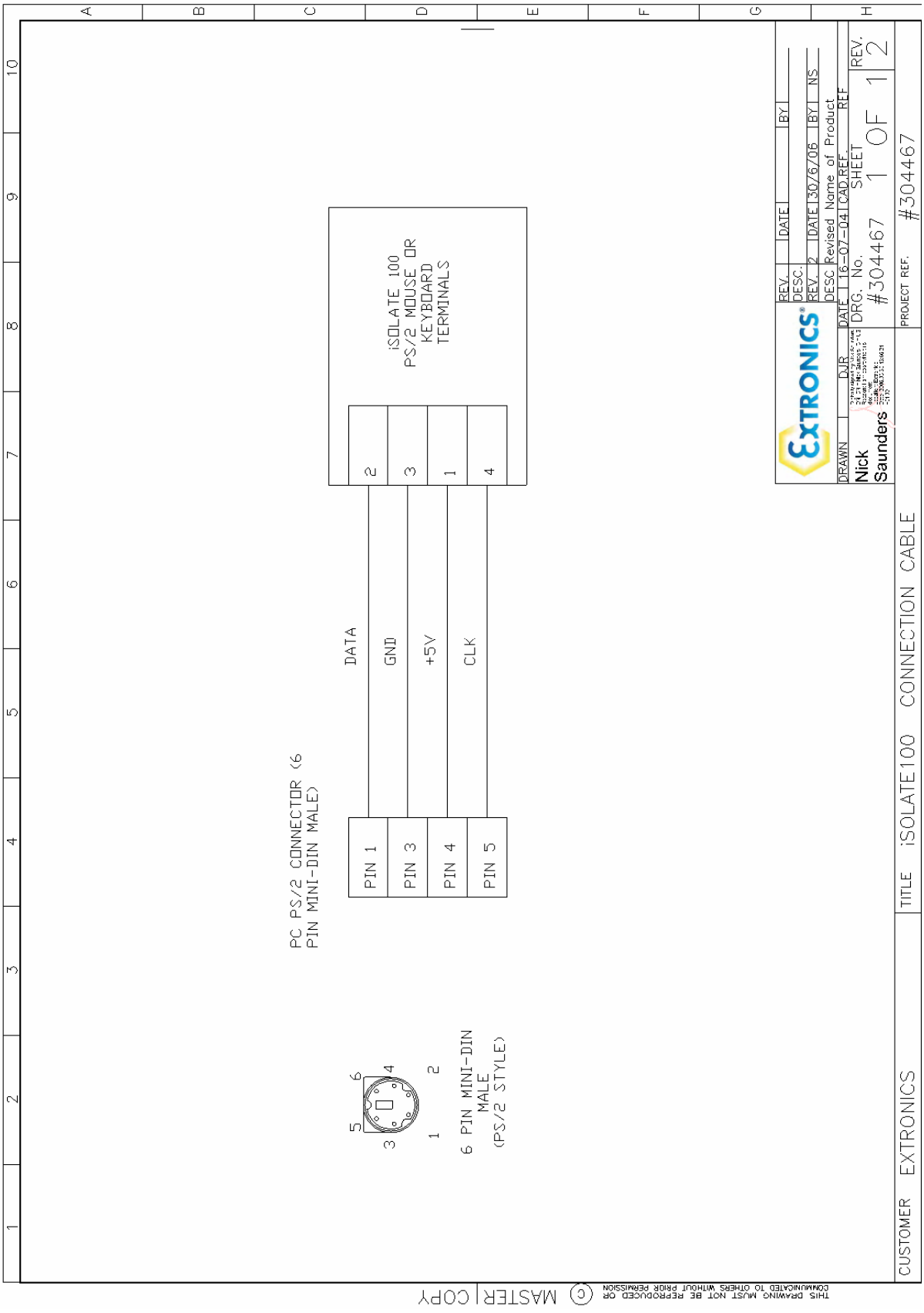
The iSOLATE100 is not designed to come into contact with aggressive substances or environments, please be aware that additional protection may be required.

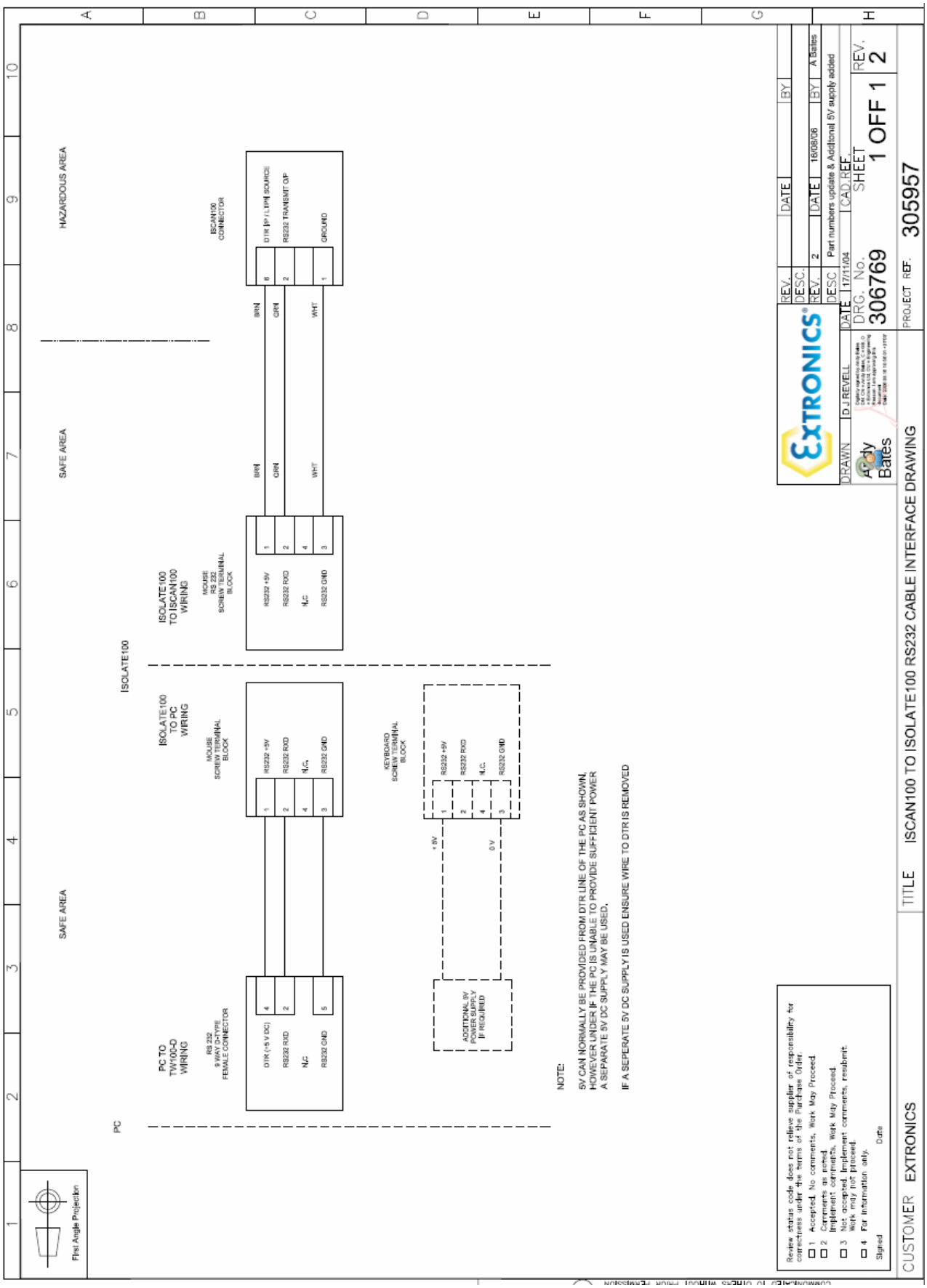
4.7 Exposure to external stresses

The iSOLATE100 is not designed to be subjected to excessive stresses e.g. vibration, heat, impact. Additional protection is required to protect against these external stresses.

The iSOLATE100 will require additional protection if it is installed in a location where it may be subjected to damage.

5 Related Drawings




PC
SAFE AREA
HAZARDOUS AREA
PC TO TW100-D WIRING
RS 232 9 WAY D-TYPE FEMALE CONNECTOR
DTR (+5 V DC)
RS232 RXD
N/C
RS232 GND
ISOLATE100
ISOLATE100 TO PC WIRING
MOUSE SCREEN TERMINAL BLOCK
RS232 +5V
RS232 RXD
N/C
RS232 GND
KEYBOARD SCREEN TERMINAL BLOCK
+5V
0 V
ADDITIONAL 5V POWER SUPPLY (IF REQUIRED)
ISOLATE100 TO ISCAN100 WIRING
MOUSE RS 232 SCREW TERMINAL BLOCK
BRN
GRN
WHT
ISCAN100 CONNECTOR
DTR [IP / L1P4 SOURCE
RS232 TRANSMIT O/P
GROUND
NOTE:
5V CAN NORMALLY BE PROVIDED FROM DTR LINE OF THE PC AS SHOWN, HOWEVER UNDER IF THE PC IS UNABLE TO PROVIDE SUFFICIENT POWER A SEPARATE 5V DC SUPPLY MAY BE USED.
IF A SEPERATE 5V DC SUPPLY IS USED ENSURE WIRE TO DTR IS REMOVED
First Angle Projection
Review status code does not relieve supplier of responsibility for correctness under the terms of the Purchase Order.
1 Accepted, No comments, Work May Proceed.
2 Comments as noted. Implement comments, Work May Proceed.
3 Not accepted. Implement comments, resubmit. Work may not proceed.
4 For information only.
Signed
Date
CUSTOMER EXTRONICS
TITLE ISCAN100 TO ISOLATE100 RS232 CABLE INTERFACE DRAWING
EXTRONICS
REV. DATE BY
DESC.
REV. 2 DATE 16/08/06 BY A Bates
DESC Part numbers update & Additional 5V supply added
DRAWN D.J.REVELL DATE 17/11/04 CAD REF.
DRG. No. 306769
SHEET 1 OFF 1
REV. 2
PROJECT REF. 305957

6 Technical Data

Ingress Protection	iSOLATE100 - IP20 iSOLATE100M - IP67
Enclosure Material	Aluminium
Weight	iSOLATE100 - 0.25 kg iSOLATE100M – 1.6Kg
Dimensions	105 x 166 x 44 mm
Ambient Operating Temperature	-30°C to 60°C
Ambient Storage Temperature	-30°C to 60°C
Operating Voltage	5VDC
Operating Humidity Range	0-75% Non Condensing
ATEX Certification	TUV 04 ATEX 2645
	iSOLATE100 = II (2) GD [EEx ia] IIC
	iSOLATE100M = II 2 G EEx m [ia] IIC T4 II D T75°C IP67

7 Type Codes

iSOLATE100 Intrinsically Safe PS2/Serial Interface	**iSOLATE100**
Description	**Part Number**
Intrinsically Safe Keyboard Interface PS/2 to PS/2	iSOLATE100-EX01
Intrinsically Safe Keyboard Interface PS/2 Keyboard Wedge	iSOLATE100-EX02
Intrinsically Safe Keyboard Interface PS/2 and RS232	iSOLATE100-EX03
Intrinsically Safe Keyboard Interface PS/2 and RS485	iSOLATE100-EX04

iSOLATE100M	**iSOLATE100M-[#1]-[#2]]-[#3]**
Please Specify [#1] - Type of configuration	
Intrinsically Safe Keyboard Interface two PS/2 safe area to two PS/2 hazardous area	EX01
Intrinsically Safe Keyboard Interface PS/2 Keyboard Wedge	EX02
Intrinsically Safe Keyboard Interface PS/2 and RS232	EX03
Intrinsically Safe Keyboard Interface PS/2 and RS485	EX04
Please Specify [#2] - Type of terminal Safe Area PC side	
Flying Leads	1
Exe Terminal Enclosure	2
Please Specify [#3] - Type of terminal hazardous Area PC side	
PS/2 Connections	1
Exe Terminal Enclosure	2
Accessories	
PS/2 to USB converter	USBCONV1
Keyboard/Mouse ExtenderCE120	

8 Certification

TÜV NORD

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) EC-Type Examination Certificate Number

TÜV 04 ATEX 2645

(4) Equipment: Interface type iSOLATE 100, iSOLATE 100m

(5) Manufacturer: EXTRONICS LIMITED

(6) Address: Meridian House, Roe Street, Congleton, Cheshire CW12 1PG, UK

(7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH & Co. KG, TÜV CERT-Certification Body, notified body number N° 0032 in accordance with Article 9 of the Council Directive of the EC of March 23, 1994 (94/9/EC), certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential report N° 04 YEX 551721 H.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997+A1+A2 EN 50020:2002 EN 50028:1987 EN 50281-1-1:1998+A1

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

iSOLATE 100 **II (2) G D [EEx ia] IIC**

iSOLATE 100m **II 2 G EEx m [ia] IIC T4 resp. II D T75 °C IP 67**

TÜV NORD CERT GmbH & Co. KG
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Hannover, 2005-05-17

Head of the

Seite 1/2

Certification Body

(13) **SCHEDULE**

(14) **EC-TYPE EXAMINATION CERTIFICATE N° TÜV 04 ATEX 2645**

(15) Description of equipment

The interface type iSOLATE 100 and iSOLATE 100m enables a galvanically separated and intrinsically safe data transmission between computers and connected peripheral devices.

The permissible ambient temperature range is -30 °C to +60 °C.

Electrical Data:

Non-instrinsically safe circuits (from the computer): U = 5 V DC; U_m = 253 V AC

Intrinsically safe circuits (keyboard and mouse): in type of protection Intrinsic Safety EEx ia IIC
Maximum values see table:

Type	U_o	ΣI_o	ΣP_o	C_o	L_o
iSOLATE 100	5,4 V	135 mA	0,7 W	65 µF	1,6 mH
iSOLATE 100m	5,4 V	135 mA	0,7 W	65 µF	1,6 mH

Characteristic line: trapezoidal

RS232 interface: in type of protection Intrinsic Safety EEx ia IIC
only for the connection of certified intrinsically safe circuits with the following maximum value:
U_i = ±15 V
The effective internal capacitance and inductance are negligibly small.

The intrinsically safe circuits are safely galvanically separated from all non-intrinsically safe circuits up to the peak value of the nominal voltage of 375 V.

(16) Test documents are listed in the test report N° 04 YEX 551721 H.

(17) Special conditions for safe use

none

(18) Essential Health and Safety Requirements

no additional ones

BA 02 01.05 1.000.000

9 Manual Revision

Revision	Description	Date	By
01	Initial Release	30/06/06	NS
02	New Template, Various changes	21/11/08	JE